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NOTICE OF ALLOWANCE AND FEE(S) DUE

109 7590 01/20/2011

The Dow Chemical Company
P.O. BOX 1967
2040 Dow Center
Midland, MI 48641

EXAMINER	
CHOI, LING SIU	
ART UNIT	PAPER NUMBER
1762	

DATE MAILED: 01/20/2011

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,379	08/14/2006	Daniel J. Arriola	63558C	7039

TITLE OF INVENTION: CATALYST COMPOSITION COMPRISING SHUTTLE AGENT FOR HIGHER OLEFIN MULTI-BLOCK COPOLYMER FORMATION

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	04/20/2011

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail Stop ISSUE FEE**
Commissioner for Patents
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

109 7590 01/20/2011

The Dow Chemical Company
P.O. BOX 1967
2040 Dow Center
Midland, MI 48641

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)

(Signature)

(Date)

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nonprovisional	NO	\$1510	\$300	\$0	\$1810	04/20/2011
EXAMINER	ART UNIT	CLASS-SUBCLASS				
CHOI, LING SIU	1762	526-114000				

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
 "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): Individual Corporation or other private group entity Government

4a. The following fee(s) are submitted:

Issue Fee
 Publication Fee (No small entity discount permitted)
 Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

A check is enclosed.
 Payment by credit card. Form PTO-2038 is attached.
 The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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		ART UNIT		PAPER NUMBER		
				1762		
DATE MAILED: 01/20/2011						

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 681 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 681 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability	Application No.	Applicant(s)	
	10/589,379	ARRIOLA ET AL.	
	Examiner	Art Unit	
	Ling-Siu Choi	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. This communication is responsive to the Amendment filed 11/03/2010.
2. The allowed claim(s) is/are 1,2,23,24 and 26-29.
3. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All
 - b) Some*
 - c) None
 of the:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) hereto or 2) to Paper No./Mail Date _____.
 - (b) including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. Notice of References Cited (PTO-892)
2. Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. Notice of Informal Patent Application
6. Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. Examiner's Amendment/Comment
8. Examiner's Statement of Reasons for Allowance
9. Other _____.

/Ling-Siu Choi/
Primary Examiner, Art Unit 1762

DETAILED ACTION

1. This Office Action is in response to the Amendment filed 11/03/2010. Claims 3-22, 25, and 30-34 were cancelled and claims 1-2, 23-24, and 26-29 are now pending.

Examiner's Amendment

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
3. The application has been amended as follows:

Claim 26, line 8, change "M3" to --M³--;

Claim 26, line 10, change "indicating the number of such X groups" to --indicating the number of G groups--.

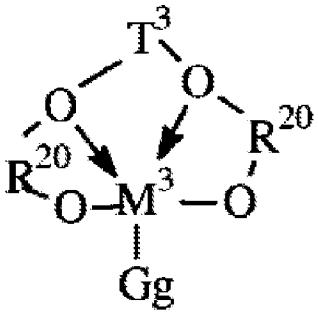
Allowable Subject Matter

4. Claims 1-2, 23-24, and 26-29 are allowed.
5. The following is an examiner's statement of reasons for allowance:

The present claims are allowable over the closest references: Mink et al. (US 2004/0242808 A1), Chien et al. [Macromolecules, **30**, 3447-3458 (1997)], Lieber et al. [Macromolecules, **33**, 9192-9199 (2000)], and Przybyla et al. [Acta polym. 50, 77-83(1999)].

Summary of Claim 1:

A copolymer formed by polymerizing propylene, 4-methyl-1-pentene, styrene, or another C₄₋₂₀ α -olefin, and a copolymerizable comonomer in the presence of a composition comprising the admixture or reaction product resulting from combining:

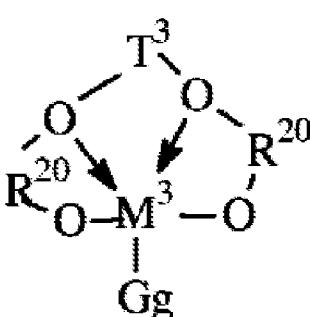
A	a first olefin polymerization catalyst comprising a complex corresponding to the formula 
R ²⁰	an aromatic or inertly substituted aromatic group containing from 5 to 20 atoms not counting hydrogen, or a polyvalent derivative thereof;
T ³	a hydrocarbylene or silane group having from 1 to 20 atoms not counting hydrogen, or an inertly substituted derivative thereof;
M ³	a Group 4 metal;
G	an anionic, neutral or dianionic ligand group;
g	a number from 1 to 5 indicating the number of G groups; and
	bonds and electron donative interactions are represented by lines and arrows respectively;
B	a second olefin polymerization catalyst capable of preparing polymers

Art Unit: 1762

	differing in chemical or physical properties from the polymer prepared by catalyst (A) under equivalent polymerization conditions, and
C	a chain shuttling agent.

Summary of Claim 2:

A copolymer formed by polymerizing propylene, 4-methyl-1-pentene, styrene, or another C₄₋₂₀ α-olefin, and a copolymerizable comonomer in the presence of a composition comprising the admixture or reaction product resulting from combining:

A	<p>a first olefin polymerization catalyst comprising a complex corresponding to the formula</p> 
	<p>R²⁰ an aromatic or inertly substituted aromatic group containing from 5 to 20 atoms not counting hydrogen, or a polyvalent derivative thereof;</p>
	<p>T³ a hydrocarbylene or silane group having from 1 to 20 atoms not counting hydrogen, or an inertly substituted derivative thereof;</p>
	<p>M³ a Group 4 metal;</p>
	<p>G an anionic, neutral or dianionic ligand group;</p>
	<p>g a number from 1 to 5 indicating the number of G groups; and</p>
	<p>bonds and electron donative interactions are represented by lines and arrows respectively;</p>
B	<p>a second olefin polymerization catalyst having a comonomer incorporation index less than 95 percent of the comonomer incorporation index of catalyst (A), and</p>

C	a chain shuttling agent.
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Mink et al. disclose a polyolefin obtained by a process comprising (a) combining a catalyst precursor and a cocatalyst, the catalyst precursor comprising a bimetallic catalyst precursor comprising a **non-metallocene compound of a transition metal** and a **metallocene compound**, and the cocatalyst comprising an **organoaluminum** component and a modified methylaluminoxane component, to obtain an activated catalyst; (b) contacting the activated catalyst with olefin monomers under polymerization conditions to form polyolefin; (c) determining at least one product parameter of the polyolefin [melt flow rate; molecular weight polymer]; and (d) varying the ratio of organoaluminum component to modified methylaluminoxane component based on comparing the product parameter to a target product parameter [target melt flow rate; target molecular weight polymer], wherein the trialkylaluminum compound comprises at least one of trimethylaluminum, **triethylaluminum**, tripropylaluminum, tributylaluminum, triisobutylaluminum, trihexylaluminum and trioctylaluminum (claims 1-13). Mink et al. further disclose that “[t]he choice of monomers used in a polymerization according to the present invention can be made by one skilled in the art based on the type of polyolefin to be produced. Polyethylenes, for example, may be produced by polymerizing ethylene, optionally in the presence of one or more higher olefins, such as one or more alpha-olefins. Suitable alpha-olefins include, for example, C₃₋₁₀ alpha-olefins, such as **propylene**, 1-butene, 1-hexene, **4-methyl-1-pentene**, and 1-octene. Mixtures of alpha-olefins may also be used” ([0086]). However, Mink et al. do not teach

or fairly suggest the claimed copolymer, wherein the copolymer is obtained in the presence of a combination of specific catalysts, and a chain shuttling agent.

Chien et al. disclose a polypropylene obtained by homopolymerizing propylene in the presence of a combination of two metallocene catalysts having different stereospecificities: rac-ethylenebis (1- η^5 -indenyl)zirconium dichloride or rac-dimethylsilylenebis(1- η^5 -indenyl)zirconium dichloride as iso-specific catalyst precursors and ethylenebis (9- η^5 -fluorenyl)zirconium dichloride as an a-specific precursor, which is activated with tritylcarbenium tetrakis(pentafluorophenyl) borate and triisobutylaluminum, wherein the products ranging from tough plastomers to weak elastomers can be obtained by varying the ratio of the two types of precursors (abstract). However, Chien et al. do not teach or fairly suggest the claimed copolymer, wherein the copolymer is obtained in the presence of a combination of specific catalysts, and a chain shuttling agent.

Lieber et al. disclose a polypropylene obtained by polymerizing propylene in the presence of a combination of $\text{Me}_2\text{Si}(2\text{-MeInd})_2\text{ZrCl}_2$ and $\text{en(Flu)}_2\text{ZrCl}_2$, which are activated by either MAO or Al^tBu_3 and trityl borate, wherein the propylene polymerization with different ansa-zirconocenes leads to the growing polypropyl chains being transferred to alkylaluminum cocatalyst, resulting in the formation of stereoblock polymer (abstract; 2nd paragraph, page 9194). However, Lieber et al. do not teach or fairly suggest the claimed copolymer, wherein the copolymer is obtained in the presence of a combination of specific catalysts, and a chain shuttling agent.

Przybyla et al. disclose a polypropylene obtained in the presence of a catalyst comprising two metallocenes [rac-Me₂Si[Ind]₂ZrCl₂] (iso-specific catalyst) and i-Pr[FluC_p]ZrCl₂ (syndio-specific catalyst) simultaneously supporting on silica/MAO, wherein the use of aluminumalkyl as a chain transfer agent leads to formation of stereoblock polypropylene (abstract). However, Przybyla et al. do not teach or fairly suggest the claimed copolymer, wherein the copolymer is obtained in the presence of a combination of specific catalysts, and a chain shuttling agent.

In light of the above discussion, it is evident as to why the present claims are patentable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is 571-272-1098. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Ling-Siu Choi/

Primary Examiner, Art Unit 1762

January 12, 2011

Application/Control Number: 10/589,379
Art Unit: 1762

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